

CLAIMS

1. A method of ion attachment mass spectrometry causing positively charged metal ions to attach to a gas to be detected in a reduced pressure atmosphere to ionize the gas for measurement of mass spectrometry, comprising:

a step of utilizing a property that the sensitivity of each component of said gas has dependency on a total pressure of said reduced pressure atmosphere and that said dependency on the total pressure differs for each component, and

a step of performing a quantitative analysis while using the total pressure data of said reduced pressure atmosphere measured on mass spectrometry for processing of the mass spectrometry data of said each component.

2. A method of ion attachment mass spectrometry causing positively charged metal ions to attach to a gas to be detected in a reduced pressure atmosphere to ionize the gas for measurement of mass spectrometry, comprising:

a step of utilizing a property that sensitivity of each component of said gas has dependency on a total pressure of said reduced pressure atmosphere and that said dependency on the total pressure differs for each component, and

a step of performing a quantitative analysis while using the total pressure data of said reduced pressure atmosphere measured on mass spectrometry for setting measurement conditions for mass spectrometry of said each component.

3. A method of ion attachment mass spectrometry as set forth in claim 1 or 2, wherein a quantitative value is calculated for said each component using sensitivity corresponding to the total pressure during measurement.

4. A method of ion attachment mass spectrometry as set forth in claim 1 or 2, wherein the total pressure during the measurement is set within an allowable fluctuation of total pressure.

5. A method of ion attachment mass spectrometry as set forth in claim 4, wherein the allowable fluctuation of total pressure is calculated for said each component using a rate of change of sensitivity corresponding to the total pressure during the measurement and a required quantitative error value.

6. An apparatus for ion attachment mass spectrometry for measurement of mass spectrometry provided with:

    a reaction chamber for causing positively charged metal ions to attach to a gas to be detected;

    a mass spectrometer for separating and detecting said gas to which the positively charged metal ions are attached;

    an analysis chamber in which said mass spectrometer is placed;

    an introduction mechanism for introducing gases containing said gas to be detected into said reaction chamber;

    an evacuation mechanism for evacuating the gases containing said gas to be detected;

    a data processor for receiving and processing a mass signal from said mass spectrometer;

    wherein the measurement of mass spectrometry on said gas to be detected is performed after causing the positively charged metal ions to attach to said gas to be detected to ionize it through said reaction chamber and analysis chamber with a reduced pressure atmosphere;

    further comprising a vacuum gauge for measuring a total pressure of said reduced pressure atmosphere;

    wherein a total pressure signal from said vacuum gauge measured during the measurement being input to said data processor,

and said data processor includes a processing means for performing a quantitative analysis of each component utilizing the fact that sensitivity of said each component has dependency on the total pressure of said reduced pressure atmosphere and that the dependency on total pressure differs for said each component.

7. An apparatus for ion attachment mass spectrometry for measurement of mass spectrometry provided with:

    a reaction chamber for causing positively charged metal ions to attach to a gas to be detected;

    a mass spectrometer for separating and detecting said gas to which the positively charged metal ions are attached;

    an analysis chamber in which said mass spectrometer is placed;

    an introduction mechanism for introducing gases containing said gas into said reaction chamber;

    an evacuation mechanism for evacuating the gases containing said gas to be detected;

    a data processor for receiving and processing a mass signal from said mass spectrometer;

    wherein the measurement of mass spectrometry on said gas to be detected is performed after causing the positively charged metal ions to attach to said gas to ionize it through said reaction chamber and analysis chamber with a reduced pressure atmosphere;

    further comprising a vacuum gauge for measuring a total pressure of said reduced pressure atmosphere;

    wherein a total pressure signal from said vacuum gauge measured during the measurement is input to said introduction mechanism or said evacuation mechanism, and said data processor performs a quantitative analysis of said each component.

8. An apparatus for ion attachment mass spectrometry as set forth in claim 6 or 7, further provided between said reaction chamber and

9. An apparatus for ion attachment mass spectrometry as set forth in claim 6, wherein

10. An apparatus for ion attachment mass spectrometry as set forth in claim 7, wherein

11. An apparatus for ion attachment mass spectrometry as set forth in claim 10, wherein

12. An apparatus for ion attachment mass spectrometry as set forth in claim 10 or 11, wherein

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said analysis chamber with a differential evacuation chamber of a reduced pressure atmosphere for connecting said two chambers in a vacuum state.

9. An apparatus for ion attachment mass spectrometry as set forth in claim 6, wherein

10. An apparatus for ion attachment mass spectrometry as set forth in claim 7, wherein

11. An apparatus for ion attachment mass spectrometry as set forth in claim 10, wherein

12. An apparatus for ion attachment mass spectrometry as set forth in claim 10 or 11, wherein

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said total pressure signal is input to said data processor and said data processing means of said data processor calculates a quantitative value of each component using sensitivity corresponding to said total pressure during the measurement and a mass signal.

11. An apparatus for ion attachment mass spectrometry as set forth in claim 10, wherein

12. An apparatus for ion attachment mass spectrometry as set forth in claim 10 or 11, wherein

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said total pressure signal is input to said introduction mechanism or said evacuation mechanism, and said introduction mechanism or said evacuation mechanism is controlled using said total pressure signal so that the total pressure of said reduced pressure atmosphere becomes within an allowable fluctuation of total pressure.

11. An apparatus for ion attachment mass spectrometry as set forth in claim 10, wherein

12. An apparatus for ion attachment mass spectrometry as set forth in claim 10 or 11, wherein

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said total pressure signal is input to said data processor, and said data processor uses said total pressure signal to monitor that the total pressure of said reduced pressure atmosphere is within the allowable fluctuation of total pressure.

11. An apparatus for ion attachment mass spectrometry as set forth in claim 10, wherein

12. An apparatus for ion attachment mass spectrometry as set forth in claim 10 or 11, wherein

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11. An apparatus for ion attachment mass spectrometry as set forth in claim 10, wherein

12. An apparatus for ion attachment mass spectrometry as set forth in claim 10 or 11, wherein

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the allowable fluctuation of total pressure is calculated from a rate of change of sensitivity corresponding to the total pressure of said reduced pressure atmosphere during the measurement and a required quantitative error value.